AMENDMENTS TO THE CLAIMS:

Claims 1-23 are pending at the time of the Office Action.

Claims 1, 19, and 22-23 are amended.

Claim 3 and 6 are canceled

Claims 1-2 and 4-5, and 7-23 remain pending.

1. (Currently Amended) A multi-junction solar cell assembly comprising:

a transparent substrate;

a transparent conductive coating formed on the transparent substrate, said transparent conductive coating comprising gallium nitride;

a plurality of gallium indium nitride junction layers formed successively on the transparent conductive coating;

an indium nitride junction layer formed on the plurality of gallium indium nitride junction layers; and

a metallization layer formed on the indium nitride junction layer,

wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer.

2. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein the transparent substrate is selected from a group of transparent substrates consisting of sapphire, zinc oxide, and gallium nitride.

3. (Canceled).

4. (Original) A multi-junction solar cell assembly in accordance with claim 1 further comprising a gallium nitride junction layer formed on the transparent conductive coating between the transparent conductive coating and the plurality of gallium Indium nitride junction layers.

5. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein each layer of the plurality of gallium indium nitride junction layers has a thickness of between about 0.2 microns and about 1.0 microns.

6. (Canceled).

7. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein each layer of the plurality of gallium indium nitride junction layers has a gallium content of between about 90 wt % and about 10 wt % and an indium content of between about 90 wt % and about 10 wt %.

8. (Previously Presented) A multi-junction solar cell assembly in accordance with claim 1, further comprising at least three gallium indium nitride junction layers, wherein each successive layer of the plurality of gallium indium nitride junction layers has a gallium content less than the immediately preceding layer of the plurality of gallium indium nitride junction layers and an indium content greater than the immediately preceding layer of the plurality of gallium indium nitride junction layers.

9. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein each layer of the plurality of gallium indium nitride junction layers has a band gap of between about 0.7 eV and about 3.4 eV.

10. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein each successive layer of the plurality of gallium indium nitride junction layers has a band gap less than the band gap of the immediately preceding layer of the plurality of gallium indium nitride junction layers.

11. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein the transparent conductive coating comprises:

a nucleation layer formed on the transparent substrate;

a lateral epitaxial overgrowth layer of gallium nitride formed on the nucleation layer; and

a defect-free gallium nitride layer formed on the lateral epitaxial overgrowth layer.

12. (Original) A multi-junction solar cell assembly in accordance with claim 11 wherein the nucleation layer comprises:

an aluminum nitride coating formed directly on the transparent substrate in intimate contact with the transparent substrate; and

a seed layer of gallium nitride formed on the aluminum nitride coating.

13. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein the transparent conductive coating comprises:

a plurality of alternating layers of gallium nitride and aluminum gallium nitride; and

a plurality of quantum wells, each quantum well of the plurality of quantum wells formed at a corresponding interface between adjacent layers of gallium nitride and aluminum gallium nitride of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

14. (Original) A multi-junction solar cell assembly in accordance with claim 13 wherein a first gallium indium nitride junction layer of the plurality of gallium indium nitride junction layers is formed directly on a last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride in intimate contact with the last gallium nitride layer of the plurality of alternating layers of gallium nitride and aluminum gallium nitride.

15. (Original) A multi-junction solar cell assembly in accordance with claim 1 wherein the transparent conductive coating comprises a gallium nitride layer formed on the transparent substrate.

16. (Original) A multi-junction solar cell assembly in accordance with claim 1 further comprising a metal current collector bus for receiving electrical power collected from the plurality of gallium indium nitride junction layers by the transparent conductive coating.

17. (Previously Presented) A multi-junction solar cell assembly in accordance with claim 1 wherein said transparent substrate is entirely transparent to solar electromagnetic radiation.

18. (Previously Presented) A multi-junction solar cell assembly in accordance with claim 1 wherein said transparent conductive coating is entirely transparent to solar electromagnetic radiation.

19. (Currently Amended) A method of forming a multi-junction solar cell assembly comprising the steps of:

forming a transparent conductive coating including gallium nitride on a substrate;

forming a plurality of gallium indium nitride junction layers on the transparent conductive coating, wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium

indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer; and

forming a metallization layer on the plurality of gallium indium nitride junction layers, wherein the metallization layer is selected from a group that includes a layer of aluminum, a layer of chromium, and a layer of titanium.

20. (Original) A method in accordance with claim 19 further comprising forming an Indium nitride junction layer on the plurality of gallium indium nitride junction layers between the metallization layer and the plurality of gallium indium nitride junction layers.

21. (Original) A method in accordance with claim 19 further comprising forming a gallium nitride junction layer on the transparent conductive coating between the transparent conductive coating and the plurality of gallium indium nitride junction layers.

22. (Currently Amended) A solar cell assembly comprising:

a transparent substrate;

a transparent conductive coating formed on the transparent substrate, said transparent conductive coating comprising gallium nitride;

a plurality of gallium indium nitride junction layers formed directly on the transparent conductive coating in intimate contact with the transparent conductive coating, wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer;

~~an indium nitride junction layer formed on the gallium indium nitride junction layers;~~ and

a metallization layer formed on the plurality of gallium indium nitride junction layers.

23. (Currently Amended) A multi-junction solar cell assembly comprising:

a substrate having a first side and a second side opposite the first side;

a metallization layer formed on the first side of the substrate;

a collector grid formed on the second side of the substrate;

a plurality of gallium indium nitride junction layers formed successively on the collector grid, wherein each successive gallium indium nitride junction layer has a thickness greater than a thickness of the immediately preceding gallium indium nitride junction layer, each successive gallium indium nitride junction layer being directly adjacent the immediately preceding gallium indium nitride junction layer;

an indium nitride junction layer formed on the plurality of gallium indium nitride junction layers; and

a glass cover on the indium nitride junction layer.